Marketing Forest Products in West Virginia

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Contents

PAGE

INTRODUCTION 5

RESEARCH PROCEDURE 6

GENERAL DESCRIPTION OF WOODLAND OWNERSHIP .. 8

SALES OF FARM WOODLAND PRODUCTS 10
- Frequency of Sales 10
- Variety of Products Sold 10
- Reasons for Sale 11

VOLUME OF PRODUCTS MARKETED 12
- Volume by Type of Product 12
- Volume by Point of Sale 13
- Volume by Species 13

VALUE OF PRODUCTS MARKETED 14
- Value by Type of Product 15
- Value by Point of Sale 17
- Value by Species 17

MARKETING PRACTICES 20
- Methods of Sale 20
- Methods of Product Measurement 22
- Methods of Product Grading 24

FAMILIARITY OF SELLERS WITH TIMBER PRODUCTS AND WITH THE TIMBER PRODUCTS MARKET 24
- Knowledge of Products 25
- Knowledge of Markets 25

HOME USE OF FOREST PRODUCTS 26
- Frequency of Cuttings for Home Use 27
- Volume of Products Cut for Home Use 27
- Value of Timber Products Cut for Home Use 28

CONCLUSION 29

List of Illustrations

FIGURE

1 Distribution of sampling areas 7
2 Forest cover composition and stand-size classes for sample units (area percentage distribution) 8
3 Percentage distribution of products marketed 12
4 Percentage distribution of volume marketed by point of sale 14
5 Percentage distribution of sales by method of price determination 20
6 Percentage distribution of sales by person measuring 23

List of Tables

TABLE

1 Number of units in sample, average unit area, and average woodland area by woodland area size class 9
2 Number of units selling by sales frequency class and woodland area size class 10
3 Total ownership units and number selling during 1947-51 period by woodland areas size class 11
4 Number of units selling by number of products and woodland area size class 11
5 Comparison of sales volume distribution and value per unit of sales volume—by product class 15
6 Cash return per 100 cubic feet of volume marketed—by product and point of sale 16
7 Species marketed—by value and major product outlet 18
8 Basis of payment 21
9 Reasons for buyer selection 22
10 Percentage distribution of volume marketed—by type of measurement unit 23
11 Distribution of sales—by presale knowledge of markets 25
12 Distribution of sales—by presale knowledge of available marketing assistance 26
13 Number of cuttings for home use by reason for cutting and woodland area size class 27
14 Average annual volume of products cut for home use—by product and woodland area size class 27
15 Average annual value of products cut for home use—by product and woodland area size class 29

Marketing Forest Products In West Virginia

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I. Introduction

WEST VIRGINIA'S forest resource has, for many years, contributed significantly to the raw material requirements of hardwood-using industries in the Nation. Although the State ranks only 40th in the Nation in terms of land area, it has been one of the six leading producers of hardwood lumber throughout the present century and, currently, stands 7th in national rank with respect to its volume of standing hardwood sawtimber. In addition to their commercial contribution, the forests, which occupy 64 per cent of the State's land area, also provide services in the form of watershed influences, wildlife habitat, and recreational use. Since forests are of considerable importance to the people of West Virginia, it follows that they must eventually come under a form of management which will insure sustained production of the goods and services involved.

Of the many facets involved in the problem of establishing and maintaining desirable forest management practices, marketing plays a major role. As in most industries, forest goods are produced in answer to consumer demand. Hence the management of forests must necessarily be geared to the markets for forest products, since these markets constitute the reflection of user demand. This close relationship between management and marketing means also that the efficiency of the marketing process will affect, to some degree, the intensity of forest management. If maximum efficiency may be defined as the optimum use of productive resources, then maximum efficiency of timber products marketing would mean that each tree, or log, be directed into the use for which it is best suited. This would yield a maximum return to each individual engaged in the marketing process. It follows from this that low returns brought about by inefficient marketing may considerably reduce, or eliminate, the incentive to practice forestry at the level of intensity required for sustained production. And incentive is particularly important in areas where a major portion of the forest land is held by small private owners.

In West Virginia, 90 per cent of the commercial forest land is held by 133,571 private owners. Ninety-nine per cent of these are small owners—with 500 acres or less of woodland—who, in the aggregate control two-thirds of the privately-owned forest acreage. Although the timber marketing problems of small woodland owners have been well described in Duerr's study of the Appalachian region,[1] there has been no specific state-wide study on the subject in West Virginia. The object of the present study is to fill this gap by investigating the marketing customs and practices of those private owners in the State who hold between 10 and 500 acres of woodland. Implicit in the study is the aim of ascertaining problem areas in the marketing process at the owner level and, by so doing, to point out the direction for further research.

II. Research Procedure

This study was undertaken as a contributory project to the Northeast Regional Marketing Project NEM-6, "Marketing Forest Products." The analysis and conclusions in this report, however, relate only to West Virginia.

A statistical design, of the area sampling type, was provided by the Agricultural Marketing Service, United States Department of Agriculture, for each state in the regional survey and, for West Virginia, it involved a distribution of 145 sampling areas throughout 26 of the 55 counties in the State (Figure 1). Interviews were conducted with all forest land owners in these sampling areas. A total of 630 complete schedules were secured for ownerships with woodland areas between 10 and 500 acres.

Farm ownership units accounted for 627 of the 630 sample units. Since the three nonfarm units represented less than 1 per cent of the total woodland acreage in the sample, they were excluded from the analysis. Accordingly, this report considers the marketing customs and practices of farm woodland owners only.

For each ownership unit, data were obtained on woodland area and composition, product use, and sales of products for the five-year period of 1947 through 1951. The forest products sales were investigated in considerable detail with information being secured on volume of products sold by type of product, species cut, unit of measurement, point of sale, and prices received; reasons for sale of woodland products; patterns of sale, including owner's familiarity with the market, initiators of sales, and methods of price determination; and the selection, grading, and measurement of products.

[1]Duerr, W. A. *The Economic Problems of Forestry in the Appalachian Region.* Cambridge: Harvard University Press, 1949. Pp. xi + 317.

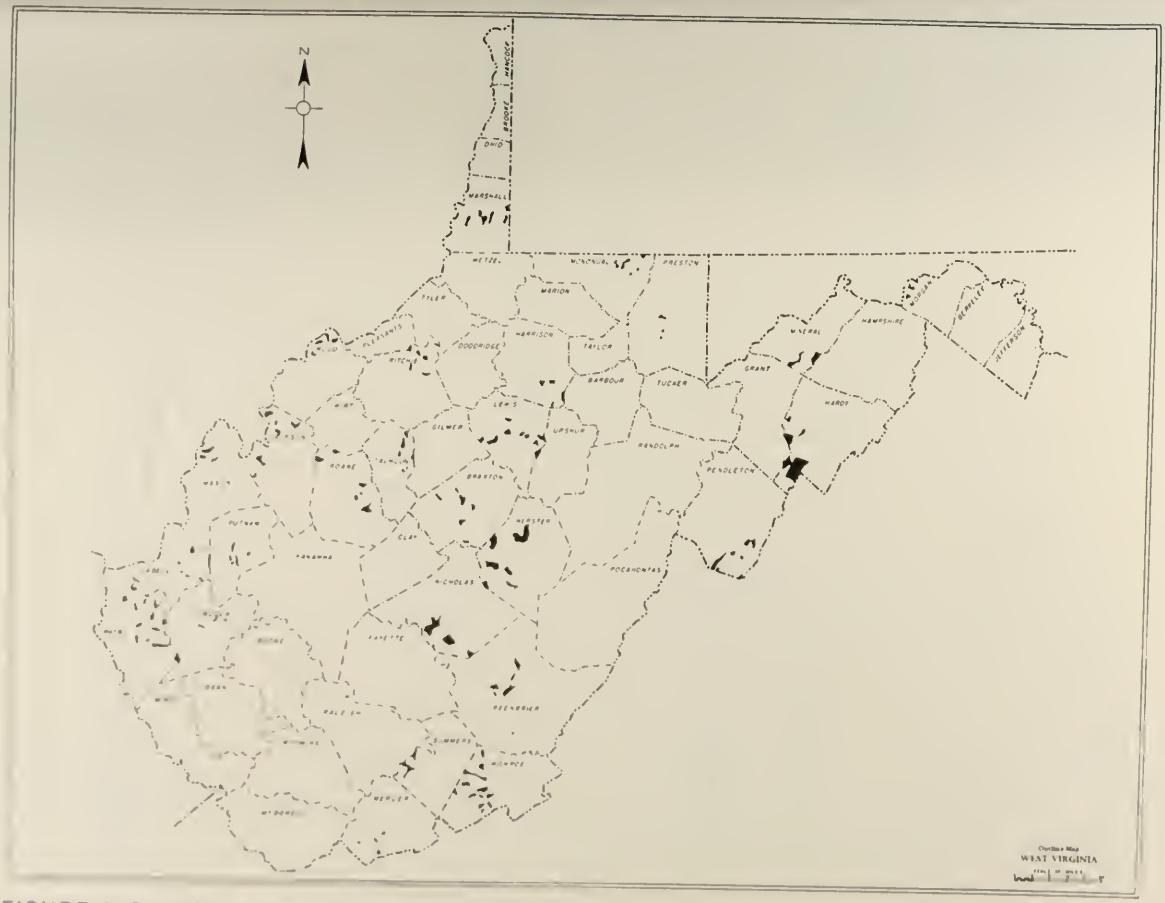

FIGURE 1. Sampling areas in West Virginia study.

III. General Description of Woodland Ownership

A total farm area of 83,279 acres was reported for the 627 sample units of the study. Forest land occupies 42.6 per cent of this area and, as would be expected in the Appalachian hardwood region, the forest land is made up predominantly of the hardwood cover types. Figure 2 indicates that almost 98 per cent of the total forest acreage is composed of the hardwood and mixed-wood types, with the hardwoods accounting for 85.2 per cent of the total. Within each of the three forest cover types an almost equal area distribution, according to stand size class, is shown.[2]

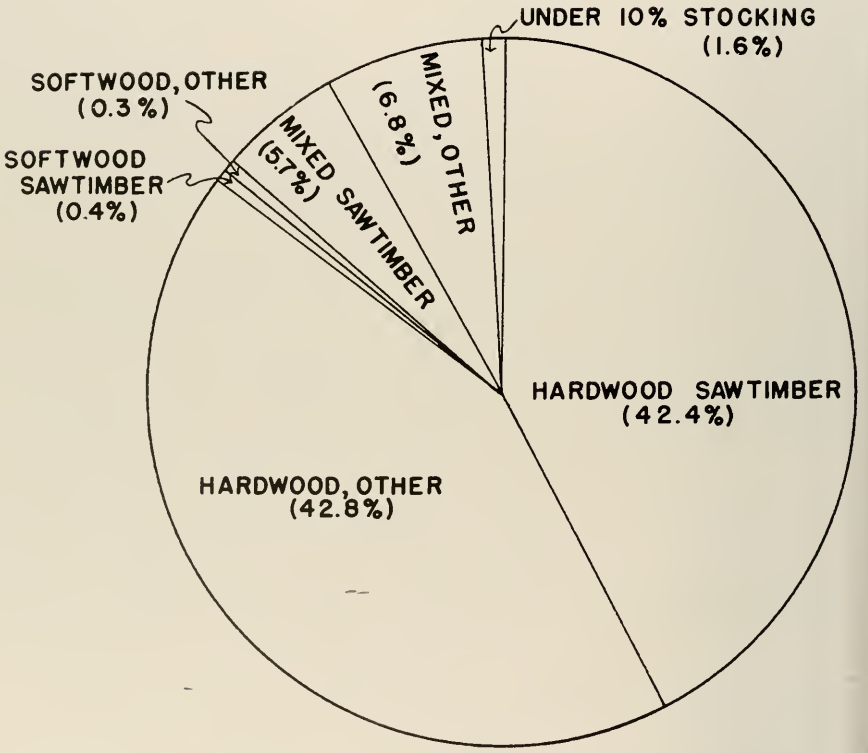

FIGURE 2. Forest cover composition and stand-size classes for sample units (area percentage distribution).

Small woodlands, ranging from 10 to 150 acres, make up the major portion of the forest area. The data presented in Table 1 indicate that

[2] *Sawtimber stand*: a forest stand containing 1,500 board feet or more per acre of trees of minimum diameter specifications. For hardwood species the minimum diameter at breast height was 11 inches, for softwood species a minimum diameter of 9 inches was required.

Other stands: a forest stand not qualifying as sawtimber.

Table 1. Number of Units in Sample, Average Unit Area, and Average Woodland Area by Woodland Area Size Class

Woodland Area Size Class	Number of Units	Per Cent of Total Units	Farm Area		Woodland Area		Per Cent of Total
			Total	Average	Total	Average	
Acres			*Acres*	*Acres*	*Acres*	*Acres*	
10-29	237	37.8	15,294	64.5	4,236	17.9	11.9
30-49	135	21.5	12,748	94.4	4,982	36.9	14.0
50-74	111	17.7	15,799	142.3	6,326	57.0	17.8
75-99	50	8.0	8,592	171.8	3,981	79.6	11.2
100-149	52	8.3	11,230	216.0	6,081	116.9	17.1
150-199	16	2.6	5,132	320.8	2,570	160.6	7.3
200-249	12	1.9	5,828	485.7	2,503	208.6	7.1
250-299	5	0.8	2,124	184.8	1,276	255.2	3.6
300-399	4	0.6	2,518	629.5	1,423	355.8	4.0
400-500	5	0.8	3,714	742.8	2,130	426.0	6.0
All	627	100.0	83,279	132.8	35,508	56.6	100.0

72 per cent of the total wooded area of the sample is found in these small woodland area size classes. Further, these small classes include 93 per cent of the 627 owner units in the sample. In addition to holding the largest portion of the woodland area, the small woodland owners also control a major portion of the sawtimber stands in the sample. Seventy-five per cent of the sawtimber acreage is in units in the woodland area size classes between 10 and 150 acres; almost 50 per cent of the total is found in woodlands of 75 acres or less.

In general, then, nearly one-half of the total area of the sample is covered by forests that (a) are predominantly of the hardwood cover types, (b) contain sawtimber stands on about 50 per cent of their area, and, (c) are comprised mainly of many small holdings.

IV. Sales of Farm Woodland Products

FREQUENCY OF SALES

Twenty-six per cent of the 627 respondents reported sales of forest products for the 1947-1951 period. The data in Table 2 reveal that more than 75 per cent of these sellers made but one sale during the five-year period; only 6 per cent of all sellers made more than two sales.

Table 2. Number of Sample Units Selling in West Virginia, 1947-51, by Sales Frequency Class and Woodland Area Size Class

Woodland Area Size Class (Acres)	Sales Frequency Class			All Classes	Per Cent Total
	1	2	Over 2		
10-49	62	12	3	77	47.0
50-99	45	10	2	57	34.7
100-199	14	4	3	21	12.8
Over 200	7	0	2	9	5.5
All classes	128	26	10	164	100.0
Per cent of total	78.0	15.9	6.1	100.0	

The data suggest also that the proportion of owners selling woodland products decreases with each increase in woodland area size class. But this might be expected because the number of ownership units in each class varies inversely with woodland area, that is, the largest number of ownership units is found in the 10- to 49-acre class, the next largest number of units in the 50- to 99-acre class, and so on. Actually, as is indicated in the last column of Table 3, no particular relationship exists between woodland area size class and number of units selling.

VARIETY OF PRODUCTS SOLD

A comparison of Table 4 with Table 2 shows that the findings on variety of products sold are almost identical with those related to

Table 3. Total Ownership Units and Number Selling During 1947-51 Period by Woodland Area Size Class, West Virginia

Woodland Area Size Class (Acres)	Total Ownership Units in Class	Number of Units Selling	Number of Units Selling as a Per Cent of Total Units in Class
10-49	372	77	20.7
50-99	161	57	35.4
100-199	68	21	30.9
Over 200	26	9	34.6
Total	627	164	26.2

Table 4. Number of Units Selling by Number of Products Sold and Woodland Area Size Class, 1947-51, West Virginia

Woodland Area Size Class (Acres)	Number of Products Sold			All
	1	2	Over 2	
10-49	63	12	2	77
50-99	42	12	3	57
100-199	14	5	2	21
Over 200	6	1	2	9
All classes	125	30	9	164
Per cent of total	76.2	18.3	5.5	100.0

frequency of sales. Of the 164 sellers, 78 per cent made one sale only and 76.2 per cent reported sale of one product only. For multiple sales and products, 22 per cent of the sellers reported making two or more sales as compared to 23.8 per cent who sold two or more products.

As might be expected, the proportion of owners selling more than one product rises with increases in woodland area. For example, sales involving more than one product were made by 18 per cent of the owners in the 10- to 49-acre class, by 26 per cent of those in the 50- to 99-acre class, and by 33 per cent of those whose woodlands exceeded 100 acres in size.

REASONS FOR SALE

Investigation of the reasons underlying the sales of woodland products indicates that need for cash was the principal motivating factor. Of 222 sales reported, 42.4 per cent were made because of financial need (current expenses or emergency cash). Clearing land for agriculture, or for other uses, was given as a reason in 21.6 per cent of all sales, and in 14.4 per cent of the sales the owners considered that their timber was mature and therefore ready for harvesting. These three reasons account for almost four-fifths of all sales; the remaining one-fifth involved a variety of reasons such as: disposal of material cut in timber stand im-

provement, budgeted cut in woodland management plan, salvage of timber damaged by various causes, liquidation of capital gain, keeping labor and equipment employed during slack periods, and high product prices currently offered.

The findings relative to sales of farm woodland products thus produce a general picture in which the majority of sales, motivated largely by owner's needs for money or for more open land, were made by small woodland owners, most of whom market one type of product in any given transaction.

V. Volume of Products Marketed

In developing a field schedule for use in the survey, 18 different product categories were included because of the known diversity in the timber products output of the Northeastern States. However, only 10 of these product classes were encountered in the investigation. The determination of volumes for these 10 products involved a variety in types of measurement units. Therefore, in order to make relative volume comparisons of the various products marketed, the volumes of the 10 classes were converted into cubic-foot equivalents. This conversion further reduced the number of product categories because of a grouping of some of the products whose individual total volumes were of negligible importance.

VOLUME BY TYPE OF PRODUCT

For the five-year period investigated, 634,456 cubic feet of woodland products were marketed by the 164 sellers in the sample area. Sawlogs were the most important product, representing more than one-half of the total volume of all timber products sold (Figure 3). Next

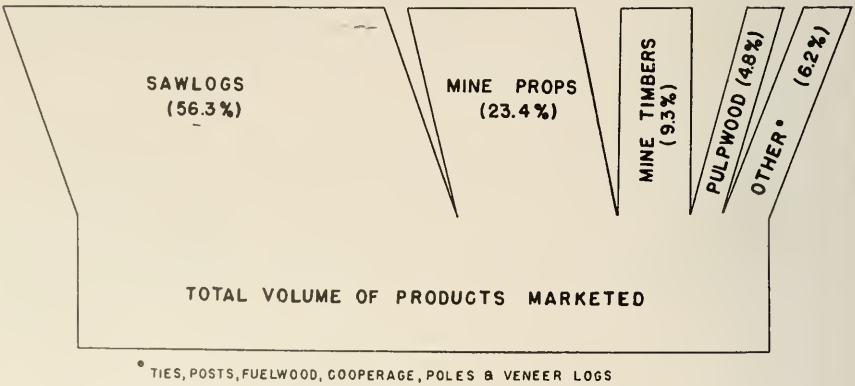

FIGURE 3. Percentage distribution of products marketed.

in importance, as might be expected in a major coal-producing State, were mine props and mine timbers. They accounted for approximately one-third of the volume of all sales. Together, these products comprised nine-tenths of the total sales volume.

The low volume of pulpwood can readily be explained by the lack of primary pulp and paper mills in West Virginia. Four mills are located just outside the State, but their pulpwood procurement areas extend only a short distance into West Virginia and thus create a fringe market area along the State's borders only. Accordingly, the major percentage of the farm woodlands are not located in pulpsheds, and the products sold therefore flow predominantly toward those wood-using and mining industries lying principally within the State.

VOLUME BY POINT OF SALE

The principal points of sale, on a volume sold basis, were on the stump and at roadside. Figure 4 shows that more than one-half of the total volume was sold as stumpage and slightly over one-fourth at roadside. The combined volume at these two points of sale accounts for 85.1 per cent of the total volume marketed.

Considering point of sale relative to type of product, 83 per cent of the sawlog volume and 98 per cent of the mine timber volume was sold on the stump, 85 per cent of the mine prop volume was sold at roadside, and 71 per cent of the pulpwood volume was sold at the mill or plant.

VOLUME BY SPECIES

Of 12 species and 5 species-groups encountered in this study, 2 hardwood species groups, northern hardwoods and mixed hardwoods, accounted for 85 per cent of the total volume of all species marketed. Beech, birch, and maple were common constituents of the northern hardwood group, while the mixed hardwood group contained few of the foregoing species and also excluded pure oak stands. The predominance of the volume in these two groups resulted from the inability of most owners to recall volume of product marketed by any specific species. Hence, in a majority of the cases, species-groups constituted the only information available. For the other three species-groups, mixed hardwood-softwood, mixed oak, and various pine species, and for the 12 specific species, the volumes reported ranged from 1/10 per cent to 1 9/10 per cent of the total volume marketed and therefore were, taken individually, of relatively minor if not negligible importance.

On the basis of the foregoing findings, the forest products market in the study area may be described as consisting chiefly of two products—sawlogs and mine props. These, coming predominantly from two hard

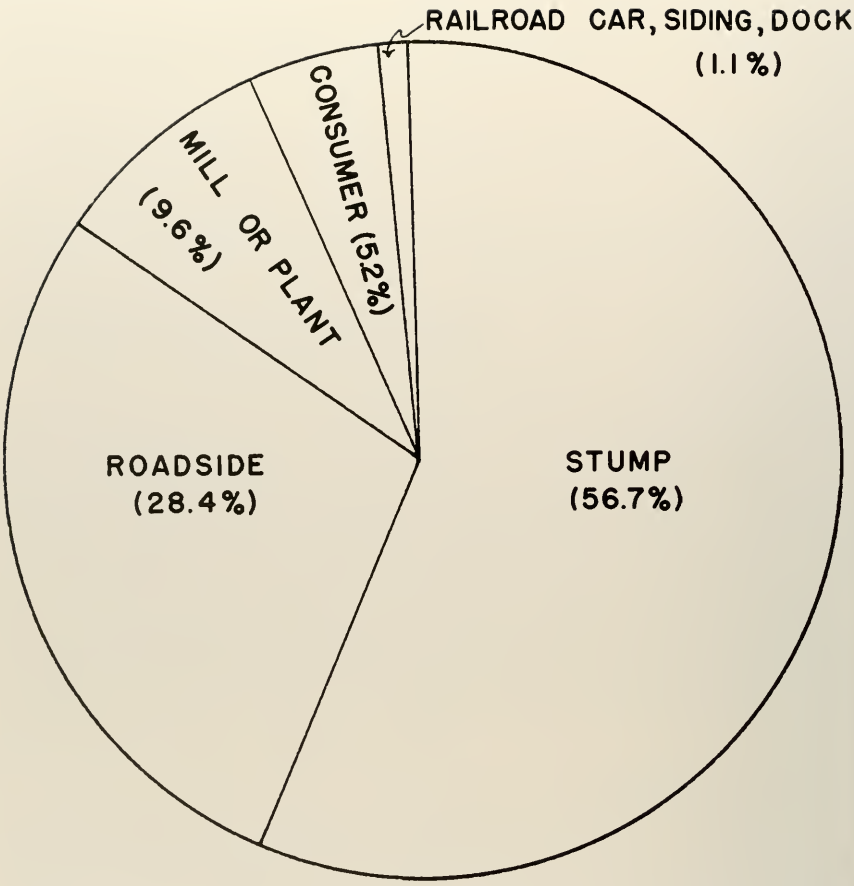

FIGURE 4. Percentage distribution of volume marketed by point of sale.

wood species-groups, are sold close to their point of origin, with stumpage sales accounting for most of the sawlog volume marketed and roadside sales representing the major portion of the mine prop volume sold.

VI. Value of Products Marketed

Although 222 sales were reported by the 164 sellers interviewed in this study, data were incomplete on 85 sales because sellers were unable to recall the sales information sought: volume of wood sold, type of product, and price received per unit of product. For the 137 sales on which data were obtained, a cash return of $59,235.56 was reported. This, since it covers a five-year period and involves 5,951 acres of forest land, represents a mean annual return of $1.99 per acre from sale of forest products.

The above findings are based on two types of sale. Twenty-five lump sum sales, involving 1,344 acres of forest land, returned $11,075.00. The remaining $48,160.56 represents the return from sales in which payment was made on a product measurement basis. Therefore, by way of comparison, the mean annual return from lump sum sales amounted to $1.65 per acre in contrast to an average annual return of $2.09 per acre from product measurement sales.

VALUE BY TYPE OF PRODUCT

An adequate analysis of value data on types of forest products requires the establishment of some unit, common to all types of products, by which value can be expressed. If this is not done, product values must be expressed in aggregative terms, i.e., total volume sold multiplied by the price received per unit of that volume. Such values, however, preclude comparative analyses because of variations in the volume of sale and because of differences in the types of measuring units employed for different type of products. Since the volumes of all products have been converted into cubic-foot equivalents, value may be expressed in terms of dollars received per 100 cubic feet of wood sold. On this basis a comparative analysis of product values is possible.

In general, considerable variation in value exists between the product classes encountered in the study. As indicated in the first column of Table 5, the values per 100 cubic feet of volume marketed ranged from $3.20 to $104.13. This variation, however, occurs in two patterns. First, the data show that product values fall into two major groups—a high-value group consisting of veneer logs, tight cooperage, posts, and ties, and a low-value group made up of the remaining products. The

Table 5. Comparison of Sales Volume Distribution and Value per Unit of Sales Volume, by Product Class, 1917-51, West Virginia
(Basis:—112 Sales)

Product	Value Per 100 Cubic Feet of Volume Marketed	Per Cent of Total Volume Marketed
	Dollars	*Per cent*
Tight cooperage	104.13	0.8
Posts	63.48	1.4
Veneer logs	32.49	0.3
Ties	26.19	1.9
Pulpwood	15.31	4.8
Fuelwood	8.10	1.3
Poles	7.40*	0.5*
Sawlogs	5.17	56.3
Mine props	4.85	23.1
Mine timbers	3.20	9.3
All	7.59	100.0

*Data from one sale only.

difference between these two groups is primarily due to the relationship between product quality and price. The highest quality products usually receive the highest per-unit prices. Quality, in this case, refers either to the expected appearance of the processed wood, as in veneers, or to certain required physical and chemical properties of wood, as in cooperage, ties, and posts.

Second, a variation exists *within* each of the two value groups. This "within" variability arises, in part, from the fact that the value of each product is a weighted average and, as such, represents the interaction that occurs between price and the volume of product marketed by point of sale. For example, although the value per 100 cubic feet of sawlogs was slightly higher at each point of sale than the value received for pulpwood (see Table 6), the average all-points-of-sale value for pulpwood was three times as great as that for sawlogs. However, 83 per cent of the sawlog volume was marketed on the stump, whereas 71 per cent of the pulpwood volume was sold at the mill. Since the price per unit of product rose as the point of sale became further removed from the stump, the *major portion* of the pulpwood volume was accordingly marketed at a considerably higher price per 100 cubic feet than was the case for sawlogs, and the resulting weighted average value of pulpwood therefore exceeded that of sawlogs.

The relatively high value for posts in the high value group, and for fuelwood in the low-value group, is most likely caused by such factors as familiarity of sellers with product, with product measurement, and with the market price of the product. These particular influences will receive further consideration in subsequent sections of this bulletin.

Table 6. Cash Return per 100 Cubic Feet of Volume Marketed—by Product and Point of Sale, 1947-51, West Virginia
(Basis:—112 Sales)

Product	Stumpage	Roadside	Siding, Dock or R. R. Car	Mill or Plant	Consumer
	$	$	$	$	$
Sawlogs	3.25	8.80	.....	19.87	22.50
Posts	.....	63.04	.....	.....	67.48
Pulpwood	3.85*	7.50	15.00	17.98	.....
Mine Props	.....	4.49	.....	8.33*	6.61
Ties	.....	.....	29.38	24.99	.....
Cooperage	39.86	.....	.....	116.67*	.....
Veneer logs	33.33	25.00*	.....	.....	.....
Mine timbers	2.98	18.18*	.....	.....	15.24*
Fuelwood	.....	8.57	.....	.....	7.14*
Poles	.....	7.40*	.....	.....	.....
All products	3.17	8.18	24.03	27.19	13.59

*Data from one sale only.

The second column in Table 5 was included to show the relationship between unit value and sales volume of the product classes. The most significant outcome of this comparison is the fact that those product classes with the lowest unit values—sawlogs, mine props, and mine timbers—made up 89 per cent of the total volume of all products marketed.

VALUE BY POINT OF SALE

The value data on sawlogs, posts, pulpwood, and mine props at the various points of sale indicate an earned increment for the additional labor and equipment required as the point of sale becomes further removed from the stump (Table 6). For the remaining products, excepting railroad ties, trends cannot be identified because in each product class reliable data occur for one point of sale only.

In the case of railroad ties, sales made at a siding, dock, or railroad car suggest that the product has been processed, presumably handhewn ties, whereas the delivery to a mill or plant implies that the product will be processed into ties at that point of sale. It is possible, therefore, that the higher value of ties at the siding, dock, or railroad car means simply that more labor and equipment are required in the processing and delivery of ties than to deliver the rough product to what normally would be a more distant point of sale.

The data in Table 6 for "all products" averages show that product value increases at each point of sale from stump to the mill or plant and then drops off at the consumer level. This drop stems from the fact that mine props, a low-value product at any point of sale, comprised 60 per cent of the total volume of all products marketed to consumers. The "all products" value at the consumer point of sale, being a weighted average, is thus influenced by the marketing of a relatively large volume of a low-value product.

VALUE BY SPECIES

Of the 12 species and 5 species-groups encountered in the survey, 9 individual species were excluded from the value analysis because the data in these cases were based on single sales. The values for the remaining species and species-groups, representing 96 per cent of the total volume sold, are shown in Table 7. The last column in the table was added to show the relationship between species value and type of product, since the value of a species usually depends upon the way its volume is distributed into various product outlets: species used principally for high-value products normally show high species values, those used for low-value products show correspondingly low species values.

Considering the above relationship between species value and product value, a question arises regarding the feasibility of using "major

Table 7. Species Marketed in West Virginia—by Value and Major Product Outlet, 1947-51

Species	Dollars Per 100 Cubic Feet of Volume Marketed	Major Product Outlet
White oak	81.22	Tight cooperage
Black locust	49.31	Posts
Black walnut	26.14	Veneer logs
Mixed oaks	16.64	Sawlogs, Ties, Pulpwood
Pine spp.	16.29	Pulpwood
Mixed hardwood-softwood	7.65	Sawlogs, Pulpwood
Mixed hardwood	7.28	Sawlogs, Mine props
Northern hardwoods	3.13	Mine timbers, Sawlogs & Mine props

product outlet" rather than a classification of species values by individual types of products. By the latter method, the value of any given species could be shown for each type of product as, for example, the value of white oak sawlogs, white oak cooperage, and white oak ties. Such a classification, although it would provide for the most effective analysis of species value, was not possible with the data at hand because the process of dividing and subdividing the number of sales for any given species resulted in too many single-sale values.

A distinct correspondence exists between product value and species value for the extremes in the array of values in Table 7. For example, the high value for white oak results from the fact that 71 per cent of the white oak volume marketed went into tight cooperage, the highest value product (Table 5). Black locust ranks second highest in species value, with 75 per cent of its volume marketed for posts, the second highest in product value. Most of the black walnut, ranking third in species value, went into veneer logs, which rank third in product value. At the other end of the scale, the low comparative value of northern hardwoods is related to the fact that all of the volume of this species-group was marketed for sawlogs, mine props, and mine timbers. As indicated in Table 5, these three products represent the least remunerative outlets.

Between the above extremes, the value rank of species depends upon the proportions of total volume going into various products. Thus, mixed oak ranks somewhat higher in value than mixed hardwood-softwood because 54 per cent of the mixed oak volume was sold for ties and pulpwood, whereas 54 per cent of the mixed hardwood-softwood volume was marketed for sawlogs. As shown in Table 5, the value of ties and pulpwood considerably exceeded that of sawlogs.

The foregoing discussion is not indicative of the degree of marketing efficiency existing in the study area. There is no way of knowing the volume of cooperage-quality white oak that was sold for sawlogs,

the volume of tie-quality oak that was sold for mine timbers, the volume of veneer-quality black walnut that was marketed for sawlogs, and so on. However, the data presented in Table 7 do indicate, to some degree, the monetary returns which attend efficient marketing.

The above may be exemplified by considering the sale of high-quality white oak for tight cooperage. The most complete utilization of the technical properties of high-quality white oak would be obtained in the tight cooperage market because white oak is practically the only type of wood which measures up to the various specifications required in the manufacture, and in the ultimate use, of this particular wood product. Therefore, efficient marketing of high-quality white oak would be achieved by channeling this species into the tight cooperage market. If sellers were to so market their white oak timber, they would, theoretically, receive a higher return than that obtainable from any of the other market outlets. This is indicated by the data in Table 7 which show that the value of white oak exceeded that of all other species and, significantly, that most of this white oak was marketed for tight cooperage. The sale of cooperage-quality white oak in other market outlets, such as sawlogs, mine props, or mine timbers, would represent a decrease in marketing efficiency and would be accompanied by a reduction in the value received for the species. Table 7 reflects this, indirectly, in the lower values shown for those species sold in the sawlog, mine prop, and/or mine timber markets. Although no values are given for white oak in these markets, there is no logical reason for assuming that the prices paid for white oak would greatly exceed these paid for the other species.

If the analytical procedure used in the above example were to be applied to other species, similar results would be obtained. It follows from this that efficiency in forest products marketing will be strongly influenced by the familiarity of forest owners with the market alternatives available to them, and with the quality of the timber they plan to market.

The preceding value analyses of products, points of sale, and species show that product values fall into two main value groups—a high value group consisting of veneer logs, tight cooperage, posts, and ties, and a low-value group made up of the remaining products. Also it is apparent that the lowest-value products comprised the bulk of the timber volume marketed; that the value of forest products tends to increase as the point of sale becomes further removed from the stump, and that species values, being related as they are to product values, are indirectly indicative of the correlation between marketing efficiency and product value.

VII. Marketing Practices

One significant result arising from the findings discussed in Sections V and VI has to do with the low value of the three products which comprised most of the volume marketed in the study area. For an explanation as to why the most important products in terms of volume were the least important in terms of value, it is necessary to examine a rather wide range of associated factors. The most logical approach in this case would be to start with the specific marketing practices that characterize the area studied because these practices are mainly responsible for the existence of the situation. Forest products marketing practices, in this study, refer to methods of sale, methods of product measurement, and methods of product grading.

METHODS OF SALE

Since product value is determined primarily by the prices paid for products, the methods of price determination would have much to do with the prices paid in the timber products market, and with the value received by timber owners from sale of their products. In this survey, price was determined by the offer of one buyer on almost three-fourths of all the sales reported (Figure 5). The results also imply that sellers were not interested in securing competitive bids. One likely cause for this is that the woodland owners probably did not know where to contact potential buyers. Further, as was pointed out in Section IV, the majority of sales were made on small woodlot ownerships. Therefore, the total quantity of timber available for sale on most of these

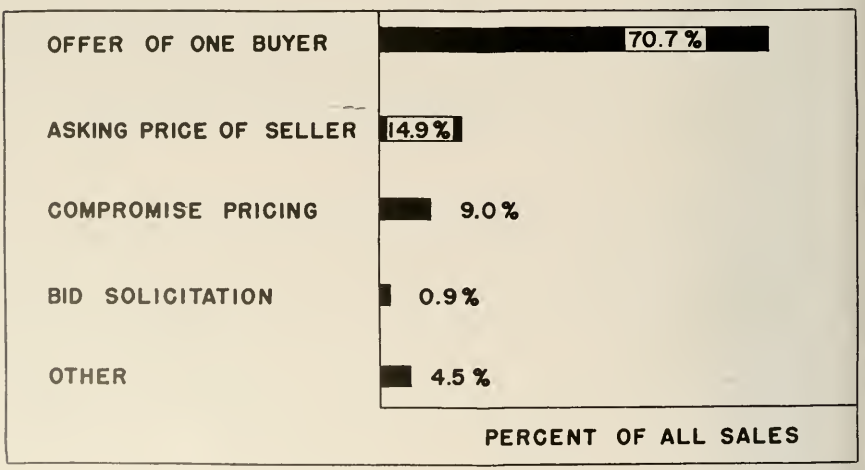

FIGURE 5. Percentage distribution of sales by method of price determination.

woodlots would be rather limited and, as such, offer little in the way of attraction to potential buyers. From this is seems probable that to obtain competitive bids might have required more time and effort than most of these woodland owners, all of whom were farmers, would care to expend on an operation which, to them, plays a minor role in the management of their total enterprise.

In addition to accepting the price offer of a single buyer, the majority of the sellers also assented to buyers' requirements with respect to various forms of measurement employed in establishing a basis for payment. As shown in Table 8, buyers established the basis for payment on 79 per cent of all sales reported. One likely explanation for this is that the sellers in this study are all engaged in agricultural production of one form or another and are generally accustomed to accepting buyers' measurement. Also, with the possible exception of fuelwood and fence posts, farmers are usually unfamilar with the techniques employed in determining timber volume and therefore must rely on buyers of forest products for estimates or measurement of volume.

TABLE 8. DISTRIBUTION OF SALES BY BASIS OF PAYMENT IN WEST VIRGINIA, 1947-51

BASIS	PER CENT OF ALL SALES
Buyer	
Lump sum	21.2
Measurement or count—delivered	20.7
Measurement or count—roadside	14.0
Measurement or count—in woods	11.7
Measurement at mill—after manufacture	9.0
Specified estimate of volume—standing timber	1.8
Specified quantity of timber to be cut	0.4
Sub-total	78.8
Seller	
Measurement or count—delivered	10.4
Measurement or count—roadside	4.1
Measurement or count—in woods	0.4
Sub-total	14.9
Other	6.3
Total	100.0

Although buyers established product price and basis of payment on the majority of sales, the timber sellers were largely responsible for instigating sales. Of the total sales reported, 59 per cent were initiated by the seller, 30 per cent by a mill buyer, 6 per cent by a logging jobber, and 5 per cent by a broker. These findings are closely paralleled by those relative to the selector of the forest products marketed. The seller selected the product to be sold on 61 per cent of the sales and buyers were the selectors on 38 per cent of the sales. Selection on the remaining 1 per cent was made by the seller and a technical assistant

In view of the fact that it was mainly the sellers who initiated the sales and selected the products to be marketed, it is interesting to note the number of sales in which sellers were ruled by noneconomic motives in their selection of a buyer for their timber products. As shown in Table 9, noneconomic reasons were given as the determinants in buyer selection in 43.4 per cent of the sales. By comparison, economic motives governed the selection of buyers on 43.9 per cent of the sales.

TABLE 9. REASONS FOR BUYER SELECTION, WEST VIRGINIA, 1947-51

REASON	PER CENT OF ALL SALES
Economic	
Best price offered	19.0
Buyer's location best for delivery	14.5
Reliable reputation of buyer	5.4
Buyer would purchase less valuable products	1.8
Buyer would purchase marked products	1.4
Additional services	0.4
Buyer would purchase a variety of products	1.4
Sub-total	43.9
Noneconomic	
Only local buyer known	21.7
Friendship	11.8
Only buyer known	6.3
Long-standing business connection with buyer	3.6
Sub-total	43.4
Other	12.7
Total	100.0

From the foregoing discussion of methods of sale, it would seem that the low unit value of the three major products might, in part, be attributed to a depressed price level caused by imperfections in the forest products market of the area. Certainly the control which buyers are in position to exert indicates the strength of their bargaining position and, as a consequence, the weakness in the bargaining position of the sellers.

METHODS OF PRODUCT MEASUREMENT

With the buyers establishing the basis of payment on most sales, it might be expected that measurement of products would be handled largely by them. This was the case. Buyers did the measuring on more than two-thirds of all sales, sellers measured products on 13 per cent, and on 15 per cent of the sales no product measurement was made.

For sales involving product measurement, two units of measure, board foot and piece tally, accounted for 92 per cent of the total volume marketed (Table 10). Slightly more than two-thirds of the volume sold was measured on a board-foot basis, most of which was based either on the Doyle log rule or on some rule unknown to the seller. A little more

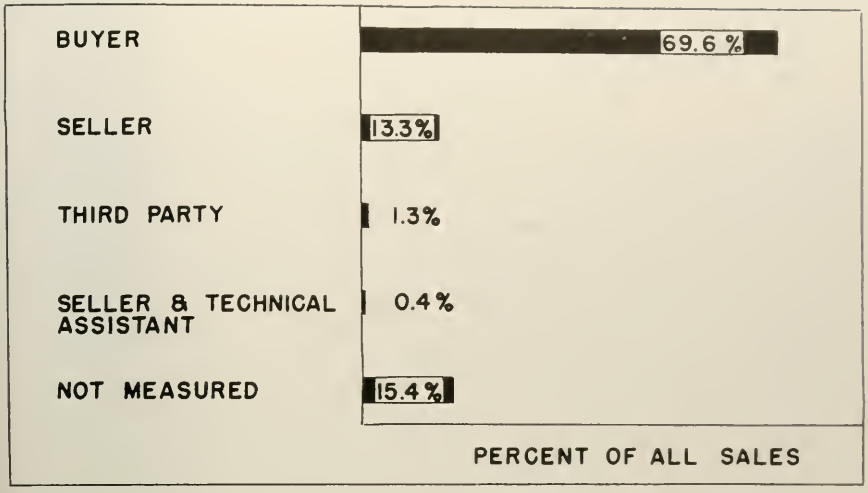

FIGURE 6. Percentage distribution of sales by person measuring.

TABLE 10. PERCENTAGE DISTRIBUTION OF VOLUME MARKETED—BY TYPE OF MEASUREMENT UNIT, WEST VIRGINIA, 1947-51

UNIT OF MEASURE	PER CENT OF TOTAL VOLUME MARKETED
Board foot	
M bd. ft.—unqualified*	41.3
M bd. ft.—Doyle rule	22.7
M bd. ft.—Doyle-Scribner rule	1.9
M bd. ft.—Scribner rule	0.6
Sub-total	66.5
Piece tally	25.4
Cord	6.0
Other**	2.1
Total	100.0

*Log rule unknown to seller.
**Includes carload, trees, and per-thousand pieces.

than one-fourth of the volume marketed was sold according to count, or piece tally.

The Doyle rule operates to the advantage of buyers when small size sawlogs are marketed because the rule, in this case, produces a rather significant under-estimate of board-foot volume. Of even more serious consequence, however, is the variability in this underscale. As Duerr has pointed out, "The chief disadvantage of the Doyle rule is not its understatement of quantity, for that error might be expected to be ironed out in the process of price formation. Rather, its disadvantage lies in the great variability of error with change in log diameter . . . twenty-inch logs generally yield about 10 to 15 per cent more than the

rule indicates; fourteen-inch logs, 30 to 35 per cent more; and eight-inch logs, more than 150 per cent more."[3]

Although no data were obtained in this survey on the log sizes marketed, it would not be unrealistic to presume that small-size logs made up the bulk of the sawlog volume sold. Also, considering the common use of the Doyle rule by private dealers in the Appalachian region, it would be reasonable to assume that this rule predominated on those sales classified under "M bd. ft., unqualified." If these assumptions are valid, then, for the major share of the product volume marketed, the measurement practices employed have clearly operated to the disadvantage of timber sellers.

METHODS OF PRODUCT GRADING

Buyer control is apparent in timber products grading to an even greater extent than in product measurement. The data secured in this study show that buyers did the grading on 42 per cent of all sales reported, sellers graded on 4 per cent, and on the remaining 54 per cent products were not graded. As might be expected with buyers doing most of the grading, the grading systems employed were mainly those developed by buyers. Buyers' grades were used on nine-tenths of all sales involving product grading; on the other one-tenth, standard grades were followed.

In review of the foregoing description of marketing practices, one point stands out significantly: that methods of sales, of product measurement, and of product grading usually operate in favor of the buyer. This constitutes a likely explanation for the low unit value of the principal products marketed by sellers in the area. Since the values for these products, as shown in the Section on value of products marketed, are weighted averages, they necessarily incorporate the effects of volume as well as price. Therefore, a combination of low product price and inequitable measurement techniques, coupled with the fact that stumpage sales accounted for more than one-half of the volume sold, implies that low product value will result.

VIII. Familiarity of Sellers with Timber Products and with the Timber Products Market

It would appear from the findings discussed thus far that farm woodland owners have marketed the bulk of their timber volume in ways which would be least advantageous to them. Since these farmers would not normally employ similar practices in marketing their dairy

[3]Duerr, W. A., *Economic Problems of Forestry in the Appalachian Region*, Cambridge: Harvard University Press, 1949, p. 190.

and poultry products, livestock, etc., it seems the selection of methods is primarily related to the degree of seller familiarity with products and with the markets in which the products are sold.

KNOWLEDGE OF PRODUCTS

Knowledge of a product usually refers to familiarity with the techniques of product measurement and with various types and grades of the product. Most of the sellers contacted in this survey apparently possess little knowledge of this nature regarding timber products. On three-quarters of the sales sellers reported that they had no presale knowledge of the quantity of timber in their woodlots, and on 23 per cent of the sales knowledge of quantity was based on a rough estimate only. As to types of products, on 86 per cent of the sales no attempt was made to sell more than one product in a single cut. Sellers also had little to do with the grading of forest products, as previously mentioned. These indications of seller unfamiliarity with timber products are as might be expected because the specialized skills required in the measurement of timber products, and in the identification of types and grades of products, are not normally possessed by most farm woodland owners.

KNOWLEDGE OF MARKETS

Of all sales reported, almost two-thirds were made with no presale knowledge of various market outlets. And, even for those sales in which sellers indicated presale knowledge, the data secured on sources from which sellers received their information suggest that such information would probably be considerably limited in scope (Table 11).

Table 11. Distribution of Sales in West Virginia—by Presale Knowledge of Markets, 1947-51

Source of Presale Knowledge	Per Cent of All Sales
Neighbor	16.7
Newspaper	0.9
Farm or county forester	0.5
Other sources*	18.6
Presale knowledge of markets	36.7
No presale knowledge of markets	63.3

*Buyer, timber broker, past experience of seller in sawmill, etc.

The probability is that information acquired from a neighbor would in most cases refer either to a sale made by that neighbor or to some sale that had come to his attention. Therefore, it seems reasonable to presume that most of the individuals comprising this particular source of presale information would not be much better informed regarding the forest products market than are those sellers who reported "neighbor" as a source of market information.

Considering "other sources," sellers most frequently mentioned a buyer of one sort or another, such as a timber broker, a logging jobber, or a sawmill buyer. It is not to be expected that these sources would be inclined to inform potential sellers of other, and possibly more remunerative, outlets for their timber products.

In addition to their unfamiliarity with markets for their products, sellers also lack knowledge relative to available marketing assistance. On approximately two-thirds of the sales, sellers stated that they had possessed no presale information regarding agencies or individuals who provide assistance in the marketing of forest products (Table 12). For those sales in which sellers reported that they were aware of available marketing assistance, the source most frequently mentioned was the farm or county forester.

Table 12. Distribution of Sales in West Virginia—by Presale Knowledge of Available Marketing Assistance, 1947-51

Source of Assistance	Per Cent of All Sales
Farm or county forester	22.1
State forest service	7.1
Private service agency	2.5
Other	4.6
Presale knowledge of available assistance	36.3
No presale knowledge of available assistance	63.7

Sellers were also questioned as to their familiarity with the management and marketing assistance provided by certain industries, particularly those manufacturing specialized products such as veneer and tight cooperage.

The results obtained show that 58 per cent of the sales were made with no presale knowledge of this type of assistance.

From the foregoing analyses it is apparent that most of the farm woodland owners are largely uninformed regarding timber products and markets for these products. These handicaps, in combination with the fact that timber sales play an incidental, and minor, role in the farm enterprise appear to constitute the underlying reasons for the marketing practices described in Section VII which, in turn, were responsible for the low unit value of the principal products marketed .

IX. Home Use of Forest Products

Although this study was concerned primarily with timber marketing practices, the importance of home use of forest products was also investigated. The results obtained, in terms of volume and value of forest products harvested for home use, and the number of owners using

their woodlots for this purpose, imply that woodlands are possibly of more significance to owners as a source of needed raw materials than as a source of money income.

FREQUENCY OF CUTTINGS FOR HOME USE

Fifty-four per cent of the respondents reported that they had cut timber products for direct use on the farm. By way of contrast, 26 per cent of all respondents, less than one-half of the proportion cutting for home use, reported sales of woodland products.

The data in Table 13 show that the bulk of the cutting was done to get needed products for homestead maintenance and repair and, as with sales of timber products, that most of the activity took place in the smallest woodland area size classes.

Table 13. Number of Cuttings for Home Use by Reason for Cutting and Woodland Area Size Class, 1947-51, West Virginia

Woodland Area Size Class (Acres)	Reason for Cutting			Total	
	Maintenance and Repair	Homestead Improvements	Other	All	Per Cent of All Cuttings
	No.	*No.*	*No.*	*No.*	
10-49	169	35	3	207	55.2
50-99	66	24	3	93	24.8
100-199	43	8	1	52	13.9
200+	16	7	0	23	6.1
Total	294	74	7	375	100.0
Per cent of all cuttings	78.4	19.7	1.9	100.0	

VOLUME OF PRODUCTS CUT FOR HOME USE

In order to make volume comparisons of products cut for home use, all reported volume data were converted into cubic-foot equivalents. As indicated in Table 14, fuelwood, sawlogs and posts comprised the principal products harvested for direct use, with fuelwood alone accounting for more than one-half of the total annual cut.

Considering volume of cut by woodland area class, the "all products" totals show a decrease in volume removed with increase in wood-

Table 14. Average Annual Volume of Products Cut for Home Use—by Product and Woodland Area Size Class, 1947-51, West Virginia

Woodland Area Size Class (Acres)	Product (in Cubic Feet)					All Products	
	Fuelwood	Sawlogs	Posts	Mine Props	Poles	Cubic Feet	Per Cent of Total Cut
10-49	74,760	11,690	6,910	577	1,650	95,587	42.1
50-99	48,090	53,570	3,085	5,522	620	110,887	47.2
100-199	26,460	5,980	1,614	0	505	34,559	14.6
200+	20,020	1,735	1,874	0	0	23,629	9.3
All classes	169,330	105,975	13,483	6,099	2,775	297,662	100.0
Per cent of total cut	56.9	35.6	4.5	2.1	0.9	100.0	

land area size class. Almost four-fifths of the total annual cut for all products came from woodlands averaging less than 100 acres in area.

An annual volume of 297,662 cubic feet of wood cut for home use (Table 14) represents 70 per cent of the total volume of all timber products harvested annually for the five-year period considered in this study. Therefore, with only 30 per cent of the total annual cut going into the forest products market, woodlands in this study area cannot be measured solely in terms of the volume of wood sold.

VALUE OF TIMBER PRODUCTS CUT FOR HOME USE

In determining values for products used directly, the best approach would be to use values obtained from sales of these products. For example, if a farmer cuts posts for fence repair, the value of the posts may be considered as the equivalent of what the farmer would have received had he sold them, or what he would have had to pay to buy them. The same principle holds for fuelwood, mine props, and poles. Determining values for these four products, in this study, was facilitated by the fact that roadside sales accounted for 100 per cent of the pole volume sold, 85 per cent of the mine prop volume, 90 per cent of the post volume, and 88 per cent of the fuelwood volume. Therefore, the following values, which represent the average amount received per 100 cubic feet of product marketed at this one point of sale, were used to determine the total value of fuelwood, posts, mine props, and poles cut for home use:

Fuelwood	$8.57 per 100 cubic feet
Posts	$63.04 per 100 cubic feet
Mine props	$4.49 per 100 cubic feet
Poles	$7.40 per 100 cubic feet

The value of sawlogs cut for home use cannot be determined by the above method. As has been noted earlier (page 14), most of the sawlog volume was marketed on the stump. However, the average return per 100 feet of sawlogs marketed at this point of sale cannot be used as a value indicator because it does not reflect the value added by harvesting, transporting, and processing the raw material into a useable product. Therefore, the imputed value for sawlogs was arrived at on the basis of the average return secured from reported sales of sawlogs delivered to the mill or plant. This figure was increased by an estimated average milling cost of $16 per thousand board feet for sawing mill-run lumber. This, converted to a cubic-foot basis, resulted in a value of $29.01 for every 100 cubic feet of sawlogs cut for home use—an estimate very likely on the conservative side because: (a) transportation cost of the lumber from mill to place of use has not been included, and (b) all available

information indicates that a $16 per thousand milling cost is probably near the minimum for custom sawing.

Table 15.*Average Annual Value of Products Cut for Home Use—by Product and Woodland Area Size Class, 1947-51—(In Dollars)

Woodland Area Size Class (Acres)	Sawlogs	Fuelwood	Posts	Mine Props	Poles	All Products	
						Dollars	% of Total
10-49	12,094.27	6,406.94	4,356.66	25.91	122.10	23,005.28	42.4
50-99	15,540.66	4,121.31	1,944.78	247.94	45.88	21,900.57	40.4
100-199	1,734.80	2,267.62	1,017.46	00.00	37.37	5,057.25	9.3
Over 200	1,373.62	1,751.73	1,181.36	00.00	00.00	4,270.71	7.9
All Classes	30,743.35	14,511.60	8,499.66	273.85	205.35	54,233.81	100.0
% of total	56.7	26.7	15.7	0.50	0.4	100.0	

*Values shown are the estimated amounts the home-user would have to pay to purchase the products.

As shown in Table 15, the average annual value of all products cut for home use was $54,233.81. This figure exceeds, by more than five times, the average annual value of all products cut for sale ($9,632.11). This indicates that forest land in the study area contributes mainly in supplying the raw materials needed on farms—posts for fence repair, fuelwood for heating, and lumber for general maintenance and repair and for homestead improvements.

The importance of farm woodlands, as a source of income, in the study area would be significantly understated, however, if value accruing through sale of timber products were used as the only criterion. On such a basis the 35,508 acres of farm woodland would yield an average return of 27 cents per acre per year. By comparison, inclusion of the value represented in the direct use of timber products increases the return to $1.80 per acre per year.

X. Conclusion

Results of this study are as might be expected in a market situation characterized by many small sellers and relatively few buyers. Usually in such a case, barring cooperative action by the sellers, most of the marketing advantages accrue to buyers. However, this alone does not explain the exceptionally weak bargaining position of many of the forest products sellers encountered in this survey. Since the inquiry dealt only with farm woodlands, a number of additional influences, inherent in this type of ownership, contribute to the unfavorable position of sellers in the timber products market.

Many woodland-farm owners have major interests in production and marketing of non-wood products—poultry, agricultural crops, livestock, and the like. The farm woodland often constitutes a supple-

mentary enterprise and, with an average area of 56 acres, a very minor one since small woodlands involve a scale of operations not sufficiently large to encourage the adoption of the most efficient methods of management by the individual. Moreover, because of the existence of certain remnants of pioneering agricultural tradition, the timber resource, by and large, is not even recognized as a crop. As a consequence, farm woodland owners generally are reluctant to spend much of their time and effort in management of their woodlands, in developing specific skills required for harvesting, measuring, and grading timber products, or in becoming acquainted with all of the marketing information necessary for efficient marketing of woodland products. The logical accompaniment to all this is low timber product value which tends to further aggravate the minor position of the timber products enterprise. Accordingly, increasingly less attention is given to management of the farm woodlands and, in turn, the position of farm woodland owners in the timber products market becomes still more unfavorable. In contrast, the major interests of timber buying centers on the production and marketing of wood products. Consequently, the buyer usually has a much clearer idea of product outlets and product values than does the seller.

It is evident from the foregoing that an eventual realization of the long run objective of "good" management on small, privately owned woodlands will depend upon the development of a more equitable marketing situation than that which now exists. If present conditions are continued, the timber seller's share of the consumer's dollar will remain relatively low, and little can be expected in the way of more conservative management on woodlands in farm ownership. Certain recommendations such as product integration, bid solicitation, familiarization with market outlets, with measurement and grading of timber products, and with marketing services, could be made here which, if followed, should improve the market position of farm woodland owners. But such recommendations have often been made in the past without effecting any noticeable change in timber marketing practices. It seems that recommendations made from the standpoint of technical forestry are not compatible with practicality from the farmers' point of view at the present time. Also, adoption of such practices might entail much more time and effort than most farmers would care to give to the forestry part of their farm enterprise, which plays a minor role in their economy.

The basic problem evolving from the above discussion is one of determining how to initiate the adoption and application by small woodland owners of practices requisite to the development of a more equitable marketing system. There are two parts to this problem: one has to do with the matter of providing timber sellers with adequate informa-

tion relative to market outlets, marketing services, product prices, and product specifications; the other involves education of timber owners as to methods of harvesting, measuring, and grading timber products. Of the two, dissemination of market information is possibly the most important area for future work because as long as timber sellers continue to be uninformed market participants, it is doubtful that the returns from sales of timber products will provide much in the way of an incentive for developing the specific skills required in harvesting, measuring, and grading of forest products.

The question of *how* to provide forest products sellers with marketing information entails a consideration not only of the various media of communication but also of the availability of information to those agencies and individuals whose work is concerned primarily with furnishing services of one form or another to land owners. Other than a quarterly bulletin published by one district of the State Conservation Commission, little in the way of steady market reporting relative to forest products exists in West Virginia. As a consequence, individuals connected with service agencies are handicapped in their ability to provide adequate marketing advice to potential timber sellers. The State Extension Forester, for example, receives many inquiries from all parts of the State seeking information on availability of various markets for wood products and on prices paid in these markets. In many cases these inquiries cannot be satisfactorily handled because the Extension Forester is hampered by a lack of marketing data. All other Extension personnel are, in general, similarly handicapped. Moreover, because they have a rather wide variety of duties and responsibilities, individuals engaged in Extension work, as well as public and private foresters, do not have sufficient time to thoroughly acquaint themselves with the forest products marketing picture in their respective areas.

From the foregoing it would seem that practical and worthwhile results might be achieved by further research. Probably the first, and most important project, should be to make a thorough survey of primary wood-using industries in West Virginia. Such a survey would yield information on the location and type of primary wood using firms in the State and should provide answers to the most frequent and common question—"What, and where, are the markets for timber?" Such information is of major significance because it involves one of the basic principles of effective marketing and management. For example, any business or firm operating with the objective of securing maximum net returns is faced with the problem of deciding how to allocate productive resources among the variety of alternatives which may be available. Therefore, since decision-making requires a weighing of alternatives it follows that the effectiveness of a firm's management decision—and

hence, in part, the degree to which it maximizes its net returns—is basically dependent upon the amount of knowledge possessed by the firm regarding *all* possible alternatives. By applying this principle to sellers in the timber products market, it becomes obvious that efficient marketing is, first of all, governed by the seller's awareness of existing outlets for his timber products—the more limited the potential seller's knowledge, the less the probability that each tree or log will be directed into that use for which it is best suited.

Additional research could also be performed in the field of price reporting. This would involve investigation of the methods by which dependable price data could be regularly obtained and most effectively transmitted to market participants. Included here also, of course, would be information on product specifications.

Finally, studies on the structure and organization of the forest products markets in West Virginia would also be of value. Information obtainable from investigation in this subject field is fundamental to a more effective appraisal of the efficiency of the marketing system and to a more specific identification and definition of the problems arising as wood products are moved from producer to consumer. In the final analysis, problems of the producer are not based entirely on causes at the producer end of the marketing chain; problems occurring throughout the entire marketing mechanism necessarily exert some influence down the line toward the producer—hence, research on market structure may be as much related to the producer as to any other functionary in the marketing chain.

Summary

This study of the marketing practices and customs of private woodland owners in West Virginia is based on a field survey of ownership units containing woodlands ranging in size from 10 to 500 acres. For each ownership unit, data were obtained during the summer of 1952 on woodland area and composition, on sales of products, and on products used directly by owners for a five-year period, 1947 through 1951.

WOODLAND OWNERSHIP

Nearly one-half of the total area in the sample is covered by forest land comprised mainly of many small farm holdings. Most of this woodland area is occupied by hardwood cover types, with sawtimber stands covering approximately one-half of the total woodland acreage.

SALES OF TIMBER PRODUCTS

The majority of the timber products sales, motivated largely by owners' needs for money or for open land, are made by owners in the

smallest woodland area classes. Most of these owners market only one type of product in any given transaction.

The principal products marketed, on a volume basis, are sawlogs and mine props. These products are derived mainly from the northern hardwoods and mixed hardwoods species-group and are sold close to their point of origin, stumpage sales accounting for most of the sawlog volume marketed, and roadside sales representing the major portion of the mine prop volume sold.

In terms of unit value, using 100 cubic feet as the unit, two product-groups appear: a high-value group consisting of veneer logs, tight cooperage, post, and ties, and low-value group composed of sawlogs, mine props, mine timbers, pulpwood, and poles. The low-value products make up the bulk, 94 per cent, of the timber volume marketed. This high proportion of low-value products is reflected in the modest return to those making sales of $1.99 per acre per year from the sale of forest products.

MARKET POSITION OF SELLERS

The marketing practices employed, methods of sale, of product measurement, and of product grading, seem to favor the buyers of timber products predominantly. This creates an unfavorable market position on the part of the timber products sellers. This situation may be partially explained by seller unfamiliarity with timber products and with the markets for these products.

HOME USE OF FOREST PRODUCTS

Farm woodlands appear to be of primary importance as a source of raw materials for direct use on the farms. Home use of forest products accounts for 70 per cent of the total volume, and 85 per cent of the total value, of all forest products harvested annually for the five-year period investigated.